

NEWSLINE

Published weekly for employees of Lawrence Livermore National Laboratory

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Researchers get a measure of Saturn

By Anne M. Stark

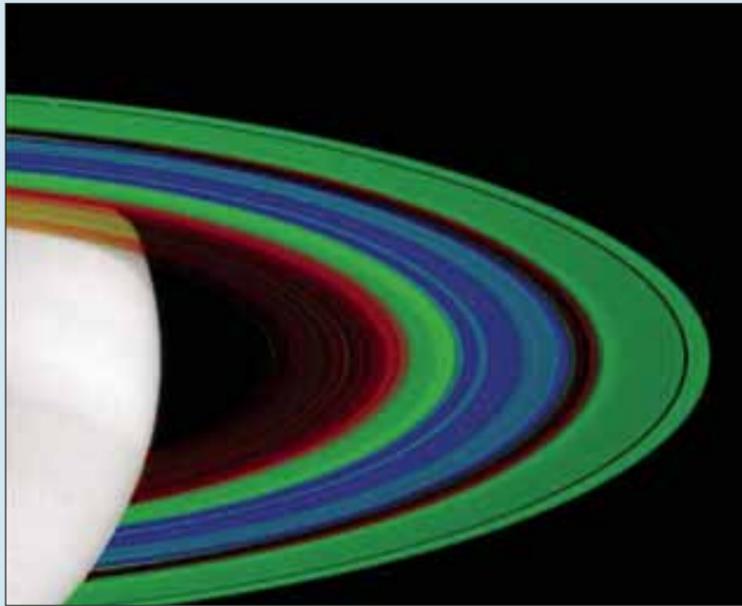
NEWSLINE STAFF WRITER

Using an infrared spectrometer on the Cassini-Huygens Spacecraft, researchers have measured the temperature, winds and chemical composition of Saturn, its rings and one of its moons, Phoebe.

The data appeared in the Dec. 23 online edition of *Science Express*.

Edward Wishnow of the Laboratory participated in the research by measuring the spectrum of methane in the laboratory at temperatures and densities similar to the planet's — about 90 Kelvin (-297 degrees F) and one atmosphere of pressure. Methane (CH₄), the principal component of natural gas, is the main indicator of carbon on Saturn and Jupiter and plays a crucial role in the planets' atmospheric chemistry and history of their formation.

The Cassini Composite Infrared Spectrometer (CIRS) is an infrared instrument that measures the intensity of far-infrared radiation, light



NASA

This false color image from the Cassini spacecraft represents the most detailed look to date at the temperature of Saturn's rings. Inner rings are slightly warmer than the outer green rings that are equivalent to -298 degrees Fahrenheit.

with wavelengths between those of radar and near-infrared light. These wavelengths are associated with radiation emission by the constituent gases of the planet's atmosphere or the ices

See SATURN, page 7

American Physical Society names five Lab fellows

By Anne M. Stark

NEWSLINE STAFF WRITER

Five scientists from the Laboratory have been named 2005 Fellows of the American Physical Society (APS). The APS late last year elected David Eaglesham, Tom Rognlien, Lou Terminello, Craig Tarver and Tina Back.

The APS Fellowship Program was created to recognize members who may have made advances in knowledge through original research and publication or made significant and innovative contributions in the application of physics to science and technology.

Each year, no more than one-half of 1 percent of the 40,000 current APS members are recognized by their peers for election to the status of fellow. Once selected as an APS fellow, APS members are fellows for life.

Tina Back, project leader for radiation transport experiments at the National Ignition Facility, was honored for "the quantitative application of X-ray spectroscopy that has advanced the understanding of high energy density plasmas in the areas of X-ray hohlraums, radiation transport, and high efficiency radiation production."

"I am very honored to be named as an APS fellow," said Back, who started at the lab in 1992 but also did some of her Ph.D thesis work at LLNL. "The study of high-energy-density and fusion plasmas is exciting and I have appreciated working with many talented collabora-

See APS FELLOWS, page 8

Laboratory plays a key role in the development of new large survey telescope

By Anne M. Stark

NEWSLINE STAFF WRITER

The LSST Corporation has awarded a \$2.3 million contract to the University of Arizona Steward Observatory Mirror Lab to purchase the glass and begin engineering work for the 8.4-meter diameter main mirror for the Large Synoptic Survey Telescope (LSST). The Laboratory is playing a key role in the development of the telescope.

The University of Arizona (UA) award covers the first of four phases in an estimated \$13.8 million effort to design, cast, polish and integrate the mirror into the LSST mirror support cell.

The LSST is a proposed world-class, ground-based telescope that can survey the entire visible sky every three nights. It will generate 30 terabytes of data per night from a three billion-pixel digital camera, producing a vast database of information

See TELESCOPE, page 7

Addressing realities of terror



SCOTT WILSON/PUBLIC AFFAIRS

SAFE (Security Awareness for Employees) Program Director Terry Turchie visits with Valley Study Group President Andy Lundberg (center back), and his wife Dorothy, and Valley Study Group members Arlene Girox and Roger Baird following Turchie's Wednesday evening presentation, with associate Kathleen Puckett, on "The Realities of Domestic Terrorism."



Celebrating Martin Luther King

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Teller's scientific legacy

— Page 4



Black holes and galactic origins

— Page 5



LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Monday
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The Laboratory is closed today in honor of **Martin Luther King Jr. Day**.

Thursday
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The Benefits Office will be making an encore presentation of **"Medicare, 65 and Still Working"** from noon - 1 p.m. in Bldg. 571, room 1301. If you are age 65 or are approaching age 65 and are still working, come and find out how Medicare coordinates with your UC Health Plan. Space is limited, call Lisa Payne, 3-0950, to register. The next Medicare presentation is scheduled for April 28.

Friday
21

This is the last day employees who use the **Eudora e-mail application** will be able to access the AIS PH Ledger Account Database. After today, users may access ledger account detail information via the MyLLNL Portal or via the Enterprise Data Depot (EDD). Detailed instructions for both methods of access, with step-by-step screenshots, can be found on the Web at https://www-ais.llnl.gov/llnl_only/docs/dw/PH_Account_Database.html. For more information, please send an e-mail to "EDD Support" at eddsupport@llnl.gov or contact Ray Lutton, lutton2@llnl.gov.

Up
&
Coming

Claire Daughtry, UC Davis instructional TV manager, will be at the Laboratory on Wednesday, Jan. 26, at noon in Bldg. 571, room 1335/1301 to discuss the **UC Davis Instructional Television Program** and the graduate engineering and computer science programs available onsite via television. For additional information, call Kathy in EODD, 2-9335.

A Lab team is looking for people interested in participating in the **Kaiser Permanente San Francisco half marathon** and 5K run/walk to raise money for disabled children. There are two races to choose from: A half marathon for all the running enthusiasts or the 5K run/walk. The races will be held Sunday, Feb. 6, in Golden Gate Park at 8 a.m. There is online registration and more information on the Web at http://www.active.com/event_detail.cfm?event_id=1178317&action=ct%20.

Prices vary according to race selection and registration date. All proceeds go to helping disabled children. To participate or for more information, contact Melissa Douthit at 2-9834.

Send calendar information by Wednesdays noon to Linda Lucchetti, lucchetti1@llnl.gov

Students from UC



JACQUELINE MCBRIDE/NEWSLINE

This week, UC Berkeley students took part in a panel discussion to learn more about Laboratory careers. The panel was part of a pilot program organized by Recruiting and Employment and the Public Affairs Office. In addition, students toured the Lab and later job-shadowed scientists and professionals.

RETIREES' CORNER

In September, **Astra Gabriel** (Energy, 2002) **Richard Sites** (Mechanical Engineering, 1998) and **Mary Sites** (Lasers, 2000) flew to Vancouver a day before their Alaskan cruise. Vancouver reminded them of San Francisco. They took a city tour of Vancouver before boarding the ship bound for the Inland Passage of Alaska on the *Serenade of the Seas*. Ports of call were Skagway, Juneau and Ketchikan. Also with their group was also LLNL employee **Bill Fankhauser** and friend Nancy. To show how small the world has become, on the streets of Skagway, Astra was surprised to run into **Laura Sewall** from Finance, who happened to be there on another cruise.

They cruised through Tracy Arm and saw Sawyer Glacier. Due to high winds and rough water, they were not able to cruise Hubbard Glacier. That was a disappointment for them. The weather, unfortunately, was inclement the whole trip, and some excursions in Juneau had to be cancelled. At one point, there were 100 mph winds and waves crashing over the porthole windows of their cabin. But that didn't keep them from wandering the streets of these historic towns and even doing a little hiking in the rain. There were so many activities on board and such a variety, that they certainly did not have time to get bored. It was Astra's first (very informative, interesting, and costly) exposure to art auctions and art collecting.

Looking back on the trip now, they think it was just great — perhaps because none of them got seasick. On disembarking, they headed to Grouse Mountain in Vancouver, BC, for a day of hiking. They took the aerial tram 1,800 feet to the summit and enjoyed a beautiful, sunny day hiking on what was an abandoned ski slope. They saw two grizzly bears and one black bear. (Astra's e-mail: astragabriel@comcast.net); (Mary Sites' e-mail: marys60@pocketmail.com).

Evelyn Heald (Mechanical Engineering and Physics, 1993) spent three weeks in Europe in September. She joined friends in Stirling, Scotland the first week and then flew to the Veneto Region of Italy for the next two weeks. Evelyn's son Vince joined her for the third week. They visited Venice, Padova, Bassano del Grappa, Asolo, Verona and Lago de Garda. They additionally spent time in Evelyn's father's hometown of Cavaso del Tomba visiting friends and relatives. The highlight of their trip there was visiting the home site of Evelyn's father, now deemed an historical site. This was her

son's first visit there and a very memorable one.

Evelyn found that many of the people she had contact with spoke little or no English and was delighted when they told her how well she spoke Italian. Interestingly enough, it was also easy to slip into the dialect of the region, which was Evelyn's first language as a child. In the not too distant future, they are planning on visiting the Piedmont region of Italy where Evelyn's mother's family originated.

Since there is no dinner/dance event in January, there will be a regular retiree luncheon at the Elks Lodge in Livermore at noon on Wednesday, Jan. 19. The speaker will be **Art Krakowsky** and his topic is TOPS (Teaching Opportunities for Partners in Science). Art gave this talk at an IEEE Conference in Texas and it was well received.

The **Travel Group** will meet on Tuesday, Feb. 22, at 2 p.m. in the Community Room of the Livermore Police building, 1110 South Livermore Ave. The topic is "The Rockies, Arches and Other Sites of Colorado, Nevada and Utah," by Bob and Juanita Berlo.

Please send any input to Jane or Gus Olson. E-mail: AugustO@aol.com or JaneRubert@aol.com. Phone: (925) 443-4349, snail mail address: 493 Joyce St., Livermore, CA 94550.

Newslines

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AROUND THE LAB



Civil rights attorney to deliver Martin Luther King keynote

Employees are invited to participate in the annual Martin Luther King Jr. Celebration, on Monday, Jan. 24, from 1 to 2:30 p.m. in the Bldg. 123 auditorium. Christopher Edley Jr., the new dean of Boalt Hall Law School at UC Berkeley and a national civil rights leader, will be this year's keynote speaker.

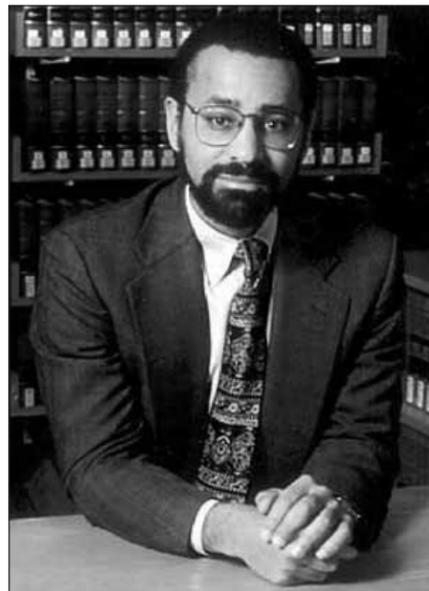
Edley is the first African American dean to lead a top-ranked U.S. law school and has a wide range of high-level policy expertise.

Prior to joining Boalt Hall as Dean in 2004, Edley taught for 23 years at Harvard Law School where he was a co-founder of the renowned Civil Rights Project, a multidisciplinary research and policy think tank that has conducted research and policy briefings for congressional staff, journalists and civil rights organizations.

Edley also served in both the Carter and Clinton administrations and is currently a member of the U.S. Commission on Civil Rights. In addition, he serves on several panels of the National Research Council, the research arm of the National Academy of Sciences.

Books written by Edley include the treatise "Administrative Law: Rethinking Judicial Control of Bureaucracy" (Yale University Press, 1990). His book "Not All Black & White: Affirmative Action, Race & American Values" (Hill and Wang, 1996), grew out of his work as special counsel to Clinton.

Edley was born in Boston and raised in Philadelphia and New Rochelle, NY. In 1973, he received his bachelor's degree in mathematics and economics from Swarthmore College. In 1978, he received a master's degree in public policy from Harvard's Kennedy School of Government and a law



Christopher Edley Jr.

degree from Harvard Law School, where he was an editor of the Harvard Law Review.

Following Edley's talk, there will be musical tributes presented by the Livermore Missionary Baptist Church Children's Choir and Isom Harrison, Library Division Leader at TID. Recipients of the Laboratory's Martin Luther King, Jr. scholarship will be introduced and will read their essays on King.

This program is co-sponsored by the Director's Office, the Administration & Human Resources Directorate and the Worklife Programs Office. For more information, call Susane Head at 3-6688.

Chertoff nominated as Homeland Security secretary

President Bush on Tuesday chose federal appeals court judge Michael Chertoff to be his new Homeland Security secretary. Chertoff is a former federal prosecutor who helped craft the early war on terror strategy.

Chertoff headed the Justice Department's criminal division from 2001 to 2003, where he played a central role in the nation's legal response to the September 11 attacks, before the president named him to an

appeals court position in New Jersey.

Chertoff would replace Tom Ridge, the department's first chief.

Chertoff is the President's second pick for the job. Former New York City Police Chief Bernard Kerik withdrew as a nominee last month.

Chertoff, whose resumé includes stints as a federal prosecutor in New Jersey and the Senate Republicans' chief counsel for the Clinton-era Whitewater

investigation, was one of the administration's key figures in the war on terror.

He took the lead in 2003 in successfully arguing the government's case in an appeal involving terrorism suspect Zacarias Moussaoui, the lone man charged as a conspirator in the September 11 attacks, and played a significant role in development of the U.S. Patriot Act to combat terrorist attacks.

Department of Energy proposes revisions to polygraph plan

In September 2003, Deputy Energy Secretary Kyle McSlarrow testified before the Senate Committee on Energy and Natural Resources on DOE's revised requirements for polygraph examinations and announced substantial changes to the DOE policy.

The changes were aimed at reducing the number of polygraphs performed across the DOE complex and requiring mandatory testing for those individuals with access to the most sensitive information. Under the proposal, the number of employees, federal and contractor, subject to polygraph testing across the complex could be reduced from 20,000 to 4,500.

The Department of Energy's proposed polygraph rule can be found at <http://www.Eas.org/spg/news/2005/01/doeo/0705.html>.

The proposed rule will include the following requirements regarding mandatory and random polygraph testing:

- Categories of federal and contractor employees subject to mandatory evaluations, including polygraphs, no less than every five

years would include: Office of Counterintelligence-related employees; most Office of Intelligence-related employees; Non-Intelligence Special Access Programs designated by the secretary; individuals with regular and routine access to Top Secret Restricted Data; individuals with regular and routine access to Top Secret National Security Information; and individuals designated by program managers in certain DOE offices and programs with approval of the secretary.

- Beyond core coverage, evaluations, to include polygraphs, of federal and contractor employees may be randomly scheduled no less than every five years for: Office of Security-related employees; Office of Emergency Operations-related employees; Office of Independent Oversight and Performance Assurance-related employees; Sigma 14 and 15 employees and those who have regular and routine access to weapons concepts and designs that could produce improvised nuclear devices; and system administrators for systems containing classified information.

Written comments (10 copies) to this proposed policy are due March 8, 2005. Oral views, data and arguments also may be presented at a public hearing, to be held at 1000 Independence Ave., Room 1E245, in Washington D.C. on March 2 at 10 a.m. To speak at this hearing, contact Andi Kasarsky at (202) 586-3012. Each oral presentation is limited to 10 minutes. The hearing will last as long as there are persons requesting an opportunity to speak.

Written comments or notification of intent to speak at the public hearing should be sent to: U.S. Department of Energy, Office of Counterintelligence (CN-1), Docket No. CN-03-RM-01, 1000 Independence Ave. SW, Washington D.C. 20585. Alternatively, you may e-mail your comments or your notification to: poly@cn.doe.gov

The deputy secretary's 2003 testimony is located on the DOE Website <http://www.energy.gov/>. Go to "Press Room" and click on "Congressional Testimony."

Power outage in Bldg. 132S scheduled for late today

Electrical power will be shut down to all of Bldg. 132S from this Friday afternoon (Jan. 14) through Monday, Jan. 17. The power outage will permit the repair of primary electrical feeder cables in Bldg. 132S.

Occupants of the building will be required to shut down their equipment and leave the

facility today by 4 p.m. No one will be allowed back into the building until 3 a.m. on Tuesday, Jan. 18.

The outage will affect the building's offices, main lobby, auditorium, conference rooms, bathrooms and the Visualization Theater. Emergency power will be available dur-

ing the weekend only to prearranged areas and equipment in the building. Individuals with requests for access or other questions should phone the on-call point of contact at 925-525-4528 from 6 a.m. to 10 p.m. or the off-shift health and safety technologist at 2-7595 from 10 p.m. to 6 a.m.



NEWS YOU CAN USE

Physics seminar to examine Teller's scientific legacy

Stephen Libby of V Division will discuss "Edward Teller's Scientific Legacy" at 2 p.m. Tuesday, Jan. 18 in the Bldg. 123 auditorium as part of the Physics and Advanced Technologies Directorate-wide seminar series.

Edward Teller (1908-2003) is widely regarded as one of the great physicists of the 20th century. His career began just after the key ideas of the quantum revolution of the 1920s had opened vast areas of physics and chemistry to detailed understanding. Consequently his early work in theoretical physics focused on applying the new quantum theory to the understanding of diverse phenomena. Topics included chemical physics, diamagnetism, and nuclear physics. Later he made key contributions to statistical mechanics and to the physics of surfaces, solids, and plasmas. In many cases, the ideas in his papers

are still rich with important ramifications.

In this seminar, Libby will illuminate Teller's intellectual origins, as well as some of his many major discoveries and their continuing significance. In some cases, such as Gamow-Teller transitions, the Jahn-Teller effect, or the Metropolis et. al. method, the initial, compelling discovery and the subsequent developments over the decades are well known. Others, such as Teller's generalization of the Wigner-von Neumann level crossing theorem that led Herzberg and Longuet-Higgins to discover Berry's Phase



Edward Teller

are perhaps less well known.

Further examples include Teller's physical explanation of Landau diamagnetism in terms of the "skipping orbits" at the edges of the material in question, and the Goldhaber-Teller proposal of universal, giant photonuclear resonances. The latter discovery was itself influenced by Teller's earlier work with Lyddane and Sachs on the asymptotic behaviors of the dielectric function of polar crystals.

Technical Meeting Calendar

January
14

INSTITUTE FOR GEOPHYSICS AND PLANETARY PHYSICS

"Ice and Carbonaceous Material in Dusty Galactic Nuclei,"

by Jacqueline Keane, NASA. Noon, Bldg. 319, room 205. All attendees need to be badged. Contact: Wil van Breugel, 2-7195, or Lisa Lopez, 3-0250.

January
18

PHYSICS AND ADVANCED TECHNOLOGIES/N DIVISION

"Gamow Shell Model Description of Exotic Nuclei," by Nicolas Michel. 10:30 a.m.,

Trailer 2128, room 1000. Contact: Erich Ormand, 2-8194, or Annette Cook, 2-7856.

CHEMISTRY & MATERIALS SCIENCE DIRECTORATE/ GLENN T. SEABORG INSTITUTE

"Extracting Chemical Information from Systems of Environmental Interest: Experimental Design and Construction," by Dr. George R. Farquar, 11 a.m., Bldg. 151, room 1209 (Common Use Facility). Foreign nationals may attend. Contact: David Ferguson, 2-5530.

ENVIRONMENTAL SCIENCE DIVISION

"Some New Thoughts on Subduction Zone Magma Systems," by John Eichelberger, chair, Department of Geology & Geophysics/Alaska Volcano Observatory, University of Alaska, Fairbanks, 11 a.m., Bldg. T1456, room 1010, Rubble Room (Common Use Facility). Foreign nationals may attend. Contact: Charles Carrigan, 2-3941.

PHYSICS AND ADVANCED TECHNOLOGIES DIRECTORATE

"Edward Teller's Scientific Legacy," by Stephen Libby, V Division, 2 p.m., Bldg. 123 auditorium (Common Use Facility).

Foreign nationals may attend. Contact: Alan J. Wootton, 2-6533.

January
19

INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT MACINTOSH TECHNICAL SEMINAR SERIES, APPLE SCITECH FORUM

"Report on the Macworld SF Science Forum," by Dave Sopchak,

10:30 a.m., Bldg. 543 auditorium. Contact: Duane Straub, 2-9774, straub1@llnl.gov.

ENERGY TECHNOLOGY & SECURITY PROGRAM SEMINAR

"The Geothermal Present & Future of Kamchatka and Alaska," by Professor John Eichelberger, chair, Department of Geology & Geophysics, Alaska Volcano Observatory, University of Alaska, Fairbanks, 2 p.m., Bldg. 543, room 2074, Vista Room (Common Use Facility). Foreign nationals may attend. Contact: Charles Carrigan, 2-3941.

January
20

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Solving DAEs by Taylor Series," by Ned Nedialkov, McMaster University, 10 a.m., Bldg. 451, room

1025. Property Protection Area. Foreign national temporary building access procedures apply. For more information see URL (<http://www.llnl.gov/casc/calendar.shtml>). Contact: Radu Serban, 4-4852, or Leslie Bills 3-8927.

PHYSICS AND ADVANCED TECHNOLOGIES /H DIVISION

"Nearsightedness of Electronic Matter," by Emil Prodan, UC Santa Barbara, 10 a.m., Bldg. 211, room 227. Property Protection Area. Foreign national temporary building access procedures apply. Contact: J. Grossman 3-6991, or D. Klein 4-2868.

PHYSICS AND ADVANCED TECHNOLOGIES /N DIVISION

"Heavy Ion Physics with the ALICE Experiment

at the LHC," by Tom Cormier. 10:30 a.m., Trailer 2128, room 1000. Contact: Jennifer Klay, 2-4058, or Annette Cook, 2-7856.

CHEMISTRY AND MATERIALS SCIENCE DIRECTORATE

"New Center for Functional Nanomaterials at Brookhaven National Laboratory," By Robert Hwang, director, 10:30 a.m., Bldg. 155 auditorium. Contact: Judy Kammeraad, 3-6757, or Kathleen Moody, 3-5948.

NAI COLLOQUIUM

"Detection of Chemical Agents Supporting International Treaties and National Security," by Armando Alcaraz, Forensic Science Center, 2 p.m., Bldg. 132, room 1000 auditorium. Classification of Talk: Unclassified. Building access requires "L" or "Q" Badge. Contact: Mona Dreicer, 2-7588.

January
21

PHYSICS AND ADVANCED TECHNOLOGIES/N DIVISION

"Have We Seen the QGP at RHIC?" by Dr. Scott Pratts, Michigan State University,

10:30 a.m., Bldg. 2128, room 1000. Property Protection Area. Foreign national temporary building access procedures apply. Contact: Ron Soltz, 3-2647, or Annette Cook, 2-7856.

INSTITUTE FOR GEOPHYSICS AND PLANETARY PHYSICS SEMINAR

"Black Holes in Galaxy Mergers," by Lars Hernquist, Harvard University, noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195 or Lisa Lopez, 3-0250.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Please submit your meetings via the new Technical Meeting Calendar form on the Web, located at <https://www-r.llnl.gov/tmc>

Researchers gain new insight into galaxy formation

By Anne M. Stark

NEWSLINE STAFF WRITER

Astronomers have discovered how ominous black holes can create life in the form of new stars, proving that jet-induced star formation may have played an important role in the formation of galaxies in the early universe.

Using the Very Large Array (VLA) at the National Radio Astronomy Observatory in New Mexico, the Keck telescopes in Hawaii and the Hubble Space Telescope, astronomers Wil van Breugel and Steve Croft have shown that "Minkowski's Object," a peculiar starburst system in the NGC 541 radio galaxy, formed when a radio jet — undetectable in visible light but revealed by radio observations — emitted from a black hole collided with dense gas.

The researchers carried out the observations after computer simulations at the Laboratory by Chris Fragile, Peter Anninos and Stephen Murray had shown that jets may trigger the collapse of interstellar clouds and induce star formation.

The astronomers presented their findings earlier this week at the American Astronomical Society 205th national meeting, in San Diego, Calif.

"Some 20 years ago this kind of thinking was thought to be science fiction," said van Breugel, who along with Croft works at the Laboratory's Institute for Geophysics and Planetary Physics. "It brings poetic justice to black holes because we think of them as sucking things in, but we've shown that when a jet emits from a black hole, it can bring new life by collapsing clouds and creating new stars."

Radio jets are formed when material falls into massive black holes. Magnetic fields around the black holes accelerate electrons to almost the speed of light. These electrons are then propelled out in narrow jets and radiate at radio frequencies because of their motion in the



This false-color image incorporates infrared data (invisible to the human eye). The blue regions (essentially the whole of Minkowski's Object) show enhanced star formation. The red background galaxy and two red foreground stars appear in sharp contrast. The red overlay is the radio jet.

magnetic fields. The jets may affect the formation of stars when they collide with dense gas.

But only recently have van Breugel and Croft figured out how this happens. The regions between stars in a galaxy are filled with mainly gas and dust, and are commonly called the interstellar medium. The gas appears primarily in two forms: as cold clouds of atomic or molecular hydrogen or as hot ionized hydrogen near young stars.

In the case of the recent discovery, the Livermore researchers observed that when a radio jet ran into a hot dense hydrogen medium in NGC 541, the medium started to cool down and formed a large neutral hydrogen cloud and, in turn, triggered star formation. Although the

cloud did not emit visible radiation, it was detected by its radio frequency emission.

"The formation of massive black holes is critical to the formation of new galaxies," Croft said.

Van Breugel, who has been studying black holes since his days as a postdoctoral fellow more than 20 years ago, said the recent observations are another good reason to study the relationship between black holes and early galaxies. He said the conditions his team saw in NGC 541 may be important in understanding the formation of galaxies in the early universe.

"Our observations show that jets from black holes can trigger extra star formation. In the early universe this process may be important because the galaxies are still young, with lots of hydrogen gas but few stars, and the black holes are more active," he said.

According to the big bang theory, the universe is believed to have originated approximately 13.5 billion years ago from a cosmic explosion that hurled matter in all directions.

Though van Breugel and Croft observed the jets by using the VLA, Keck and Hubble images, they also said that the Livermore computer simulations by Fragile, Anninos and Murray were crucial to verify that this is happening.

NGC 541 is approximately 216 million light years from Earth and is roughly half the size of the Milky Way.

In addition to van Breugel and Croft, other collaborators on the project include W. de Vries, UC Davis; J. H. van Gorkom, Columbia University; R. Morganti and T. Osterloo, ASTRON, Netherlands; M. Dopita, Australian National University; Fragile, UC Santa Barbara; and Anninos and Murray, LLNL.

Analysis of interplanetary dust yields clues to longstanding mystery

By Anne M. Stark

NEWSLINE STAFF WRITER

Carbon and silicate grains in interplanetary dust particles are helping scientists solve a 40-year-old astronomical mystery.

Using a transmission electron microscope, Laboratory researchers have detected a 5.7-electron volt or 2175 Å (angstrom) wavelength feature in interstellar grains that were embedded within interplanetary dust particles (IDPs). They found that this feature is carried by carbon and amorphous silicate grains that are abundant in IDPs and may help explain how some IDPs formed from interstellar materials.

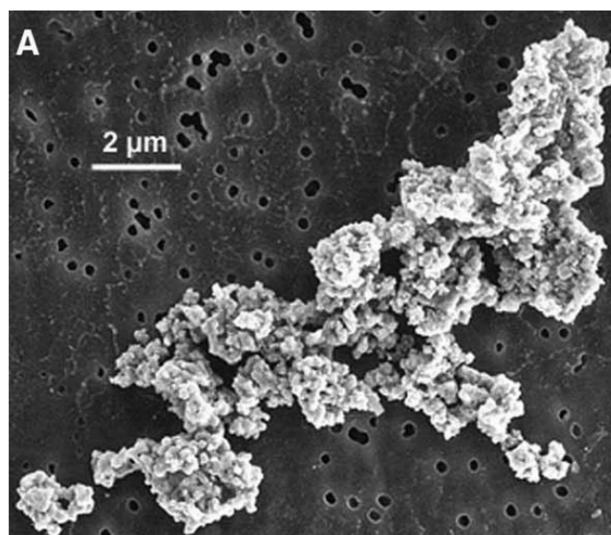
The research appears in the Jan. 14 edition of the research journal *Science*.

Interplanetary dust particles gathered from the Earth's stratosphere are complex collections of primitive solar system and presolar grains from the interstellar medium. The strongest ultraviolet spectral signature of dust in the interstellar medium (the gas and dust between stars, which fills the plane of a galaxy) is the astronomical 2175 angstrom feature or "2175 Å bump." Production of this interstellar feature is generally believed to originate from electronic transitions associated with the sur-

faces of very small grains.

The carbon and silicate grains may have been produced by irradiation of dust in the interstellar medium. The measurements may help explain how interstellar organic matter was incorporated into the solar system. In addition, they provide new information for computational modeling, laboratory synthesis of similar grains and laboratory ultraviolet photo-absorption measurements.

"Our finding potentially breaks a log-jam in the search for the carrier of the astronomical 2175 Å feature," said John Bradley, director of Livermore's Institute for Geophysics and Planetary Physics and lead author of the paper. "Over the past 40 years, a whole variety of exotic materials have



An up-close image of a typical chondritic interplanetary dust particle at the secondary electron scale.

been proposed, including nanodiamonds, fullerenes, carbon 'onions' and even interstellar organisms. Our findings suggest that organic carbonaceous matter and silicates, the 'common stuff' of interstellar space, may be responsible for the 2175 Å feature."

Other Livermore scientists include Zu Rong Dai, Giles Graham, Peter Weber, Julie Smith, Ian Hutcheon, Hope Ishii and Sasa Bajt.

Outside collaborators on the project include researchers from UC Davis, Lawrence Berkeley National Laboratory, Washington University and NASA-Ames Research Center.



CLASSIFIED ADS

See complete classified ad listings at
<https://www.ais.llnl.gov/newsline/ads/>

AUTOMOBILES

1964 - T-Bird. Black, runs well, good paint. Interior may need some work. \$6000.00 925-325-1123

1985 - 85 Jeep CJ7. silver, 4wd, soft-top, bikini-top, car cover, new motor and clutch, new vacuum lines, new tires, new seats. \$4500.00 obo. 209-599-8523

2002 - Firebird TransAm, midnight blue, T-Top, 6-speed, 5.7 liter Ram-Air engine, 48k miles, good condition, new Tires/brakes/ rotors, \$19,400 OBO. 925-648-0870

1991 - Mazda MPV, 139K mi, 6 cyl, all power options, well maintained, great commute & family car, original owner - \$1900.00 415-543-3643

2001 - VW Jetta, Black 1.8T Wolfsburg Edition 62K, 5speed, pwr everything, 6CD, premium wheels, tinted windows, sun roof, certified pre-owned \$12,500 o.b.o 209-834-0642

2001 - Mercedes-Benz SLK230 Convrtbl; 23K mi.; Brt Blue; 2-dr.; abs/ac/pc/cc/tilt; lthr; pwr. everything; BOSE am/fm w/CD chgr; 6-spd. manual; 4 Cyl; \$29995 925-209-4864

1992 - Pontiac Bonneville. 85K miles. Very good condition. Runs great. AC, ABS. Selling because of moving out of the country. \$2100. 925-875-0890

1991 - Acura Legend, taupe color. 104K miles. Excellent condition. \$3,500. 530-219-1931

1997 - Chrysler Sebring Convertible LXI. Excellent condition, Black w/gray leather interior, automatic, 6 Disc CD Player. 90k. \$8000 obo 925-250-9779

1998 - Mustang GT, convert., AT, AC, prem. sound system, Flowmasters, red w/ beige leather int., new brakes, excell. cond., 95K miles, orig. owner; \$9,300 925-447-9319

1988 - Acura - Legend - 4-door, Man-tran, sunroof, good cond., single owner, 126k mi. 925-449-9255

2002 - VW Passat GLS 4D-sedan, 1.8L Turbo, 35k miles, air bags front & sides, custom chrm wheels, full VW warr till 06, tinted-glass, MINT \$14,450 209-814-4064

1994 - Honda Accord LX 4 Door Sedan. Blue/Grey Exterior. Leather, Blue Interior. Excellent condition. 90K miles. \$4,800. 925-846-1871

1997 - Eldorado, 27k miles, excellent condition, cassette, extra warranty. Call for more info. 510-582-2938

2000 - Dodge 15-passenger van, 120k mi, dual heat/air, PW/PL/CC, privacy glass, cloth bench seats, new tires, running boards, AM/FM Cassette. 209-892-2118

1992 - Ford Taurus - \$1000.00/Best Offer. Runs good. 925-684-0134

2002 - Toyota Echo, 2 Dr, 5 spd, <60 kmiles, ~40mpg, fine shape, moving and must sell, \$7100 obo 510-465-6679

1993 - Honda del Sol Si,

126,500 miles, 5-speed manual transmission, bright green, \$4,500 925-447-6719

1996 - Acura TL AT, AC, Power everything, Loaded Leather Always Garaged Clean. \$7500.00 OBO 209-551-3507

1999 - Honda CRV EX, 33,000 miles, AT, AWD, ABS, CD, keyless entry, roof racks, asking \$11,500 925-447-2641

1998 - Audi A8 Quattro, 95k miles. Looks and runs fantastic, fun smooth ride. Auto everything, lots of extras like heated seats! Must see, mint, \$19k. 925-784-7166

AUTOMOBILE ACCESSORIES

Tire Chains. Fits many tire sizes; too numerous to list. Call with tire size, 4-6266. \$20. 510-914-1065

New Tire/Wheel 205x75x15 reasonable offer considered. 925-735-6002

Cable Chains. New in tote bag. Fit Class S car sizes (smaller 13, 14, & 15 inch). Call for your size. \$20 925-455-0577

Aluminium Truck Tool Box, Fits full size Dodge PU. 64.5 long by 20.5 wide by 14.5 deep. Like new. Bought new for \$450.00. Asking \$250.00 925-413-4881

New dodge bedliner from my shortbed 2005 ram PU. Should fit all 2003 and newer trucks. Will deliver to LLNL for the swap into your PU. Asking \$150 209-368-4286

BICYCLES

Bike AT 21 speed recumbent bicycle. Rear suspension, commuting seat bag, upgraded seat. Excellent bike to commute in from Livermore. \$500 925-462-1554

BOATS

17ft fisher 1993 fish&ski, 60hp merc, trolling mtr, walk thru windshield, pedestal seat, 2 fishfinders, lots of storage, seats 6, \$5500 obo 925-872-6111

CAMERAS

Digital Camera - Fujifilm FinePix 6800 Excellent condition, w/case, charge cradle + memory card. 3.1w x 3.8h x 1.4d \$150 obo 925-218-2278

ELECTRONIC EQUIPMENT

Computer . AMD 1Ghz 512ram-40gb-cd-rw Please call me for all details of the computer. 510-506-1728

Sony 20inch TV with remote \$90, Onkyo hi-end turntable, great condition with cartridge \$100 415-543-3643

Canon Color printer BJC-610 \$18 925-735-6002

Marantz 2220 Receiver with external wood enclosure, manual; Needs Front Panel Light; \$60. Dyna FM-3, manual; \$60. 510-865-2997

HP Deskjet 610CL color printer with cable. Hardly used, 50.00. HP color printer, scanner and copier 100.00. Got two for

Christmas. 510-537-7222

SONY 5 disc CD player - excellent condition. \$30/obo 925-846-8394

Drake TR-4 sideband transceiver, MS-4 speaker, instruction manual. Best offer. 925-443-2510

Sony monitor, speakers, keyboard and modem all in good working condition. \$50.00 510-537-7222

GIVEAWAY

Carpet, free, you pick up. Two, used, high quality pieces of carpet w/ pad, 22x17 ft and 18x13 ft. Neutral color, cut berber style. 925-454-5214

20 gallon glass aquarium. In good condition. 510-683-9433

Mac SE & Dot Matrix printer. Mac LC II & LaserWriter. Both bundles in good condition. Free to good home. 925-455-0577

Bed frame. Fits twin/single or full/double mattresses. Very good condition. 925-462-6607

Waveless King Size Water Bed Materess, made by Aqua Queen with heater system. Perfect shape. 209-835-9469

Gymnastics bar for young child (under 10), Computer desk: new, still in box, needs assembly 925-449-0463

HOUSEHOLD

Loft Bed, metal. accommodates twin size mattress. 1 yr new, gently used, gun metal grey color, \$120.00. Please call after 6:00pm. 925-462-2838

4 Breuner chairs with arm rest, like new \$50 for set of 4 415-543-3643

Queen size mattress, box spring, and metal frame. Rarely used - from guest bedroom converting to baby room. \$100.00, Phone: 209-239-5685

Rockwell 15 in. drill press, model 15-069, floor model, exc. cond. \$125. 209-239-8984

Canning Jars: Several dozen Ball jars, quarts and pints. \$5/doz. 925-443-8449

King size Mattress set \$100, Love seat & refrigerator B/O.. All in great condition. 209-983-0190

Dining Table - Glass w/4 upholstered chairs orig \$1300. \$250 925-449-1481

Couch & loveseat \$50 Beige with light floral pattern needs cleaning- otherwise good quality in good shape close to Lab 925-443-6603

Oak Entertainment center with glass doors holds TV and Stereo equipment plus lots of storage. 925-447-9785

Refridgerator - White, top freezer. Works great - \$25. Washing Machine -super capacity, 3 speeds/multi-care wash. Works great - \$25. 209-599-7893

Hoover Dirt Finder vacuum with allergen filtration with one attachment. Good for second vacuum. 30.00 510-537-7222

Oak Dining Table and Chairs: 48in round with one 24in leaf, four high back chairs. \$100 for

set 925-449-8945

Ryobi compound miter saw \$15. Old but works fine. Missing blade guard. 925-606-9575

Cool mist humidifier \$5. Ultrasonic humidifier, new, \$30. 925-454-0877

Light oak coffee table and square end table, great cond. heavy wood. \$100 for both 925-240-8586

LOST & FOUND

LOST Womens frameless prescription glasses in or around Building 319. Call 3-0633, or 925-209-4864

MISCELLANEOUS

DOUBLE STROLLER. Baby Trend Sit-N-Stand LX IV Plus. Very high quality construction. Great condition. Was \$200 new. Sell for \$75. 925-454-8827

Royobi BS900 9in. band saw on floor stand w/three blades, exc. cond. \$75. 209-239-8984

Little Tikes kitchen, w/play food and lots of utensils, like new \$25.00. Little Tikes easel (black board & drawing pad) like new, \$25.00. 925-998-0324

Kennedy toolbox - 10in W x 18 in L x 12in H. Good condition. Great for tools or tackle. 8\$ Badger model 180-1 oilless diaphragm compressor 25\$ 925-484-0734

4 inch new roll drain pipe \$28, platfor scale 140lb. cap \$30, air compressor \$40 925-735-6002

Hunting Gear - Lots of items, all practically new. Clothing, Innotek Bird Releasers, scopes, tree stand, boots, Filson. Must move, best offer. 510-499-0931

CRAB FEED: Friday 2/11/05. Aahmes Shrine Novkeps. Centennial Hall, Hayward. Live C/W music, prizes. Best Crab Feed Around. Call for tickets. \$30 ea. 925-449-5667

Scanner, Microtek X6EL, flatbed. 600 x 1200 dpi, 32 bit color. Brand new, never used. \$50.00. 925-443-2510

Craftsman radial arm saw with stand, \$50 firm. About 10 yrs old. Well used, but can be tuned up and with lots of life left. 925-606-9575

Motherhood nursing dress, long sleeves, cornflower blue, Sz. sm/med, worn once. \$20. 925-454-0877

Boys clothes, mostly sz. 4, incl. winter coat and Snow boots sz. 11, \$1-\$5. Preschool toys, games, puzzles, videos, software, \$1-\$10. 925-454-0877

Large pottery/ceramic kiln, adjustable, 7 rings, great cond. \$500.00 Pouring table with access. \$300. 925-240-8586

Spa and gazebo, Dimension One, with cover, \$1500 925-806-0877

MOTORCYCLES

1999 - Harley Davidson Road Glide - Black, 9380 miles. Custom Rear End, tailpipes, Corbin Seat, Saddle Bags, 19 inch tires. Must See. 22K Tracy 584-0857, 925-292-1200

2002 - XR 650R big power runs great 3000.00 925-337-0057

MUSIC INSTRUMENTS

Suzuki violin, 1/4 size, Wolf violin headrest (1/2 size), all like new. Make offer 415-543-3643

Wurlitzer upright piano w/bench, great cond. no time for lessons. Similar model appraised at \$1100 Asking \$400 obo. In Livermore, you move. 925-294-9646

Cymbal stand. Mapex brand, hvy duty, dbl braced. Unused, 1/05. \$50 925-373-6255

PETS & SUPPLIES

Pit Bull/Sharpei mix/female/5 mos. old/house trained/crate trained. Outside during the day and sleeps in her crate at night. Call at 510-247-0747

18 mo old Aussie Shepherd, does not see well, for good home only. Must be part of family, sleep inside. 925-325-1123

Free female Australian Shepherd mix; 7 years old; spayed. Moving and need to find her a good home. She is awesome with kids. 209-993-7340

Got a dusty, old Herp Habitat lying around? Will take it for the kids at home and school. Give it away or name me a good price. 925-202-3512

AKC Yellow Lab. Retriever stud, looking for a female AKC registered Lab to mate with. Please leave message, 4-5814 209-983-8372

RECREATION EQUIPMENT

Exercycle. Barely used Edge 2500 with remote operated magnetic resistance and heart rate monitor. Super comfortable seat. Cost \$250 new. \$75 OBO. 925-200-9976

Compact Life Flex Gym with bench and weights. Never used. Storage size is 4 ft. x 3ft. \$150 925-516-4973

Proform Treadmill 725 - \$200. Top of line. Space save. 55x20 inches, bigger than most. Very little use. Originally \$900. 510-499-0931

2004 DeMarini singlewall softball bat. Used in six games. Warranty good until 4/25/05. Great condition. \$100.00 209-834-0642

Portable Basketball Hoop by Spalding. 48 inch easy lift with water or sand filled base - \$50. 925-606-6422

Century brand, 100lb, unused! \$75.00 925-373-6255

Ladies Skis - Kneissl 150 + poles- \$60. Raichle Boots 8.5 M, \$35. Used little. 925-447-8415

RIDESHARING

Express your commute, call 2-RIDE for more information or visit <http://www-r.llnl.gov/tsmp>.

Oakland-Montclair Dist. - AWS Vanpool seeking new riders/drivers. Leave Oakland @ 7:00am arrive @ LLNL ~7:35am. Leave LLNL @ 5:30pm arrive in Oakland 6:10pm. 510-569-7132, ext. 4-5173

AIS PH ledger account database unavailable later this month

The AIS PH ledger account database phone directory, currently accessible via the Eudora e-mail client, will no longer be available after Jan. 21. After this date, current users of this database or of the Eudora lookup feature will need to begin accessing ledger account detail information through one of two methods, depending upon the level of access required.

The first method is the Portal account lookup portlet, which is accessible through the MyLLNL Portal (<https://www-r.llnl.gov/>). Click on the "Res Mgt" tab located near the top right of the page to navigate to the

resource management page. Near the top left, users will see an "RA tools" sub-tab. Click on this sub-tab to navigate to the "account lookup" portlet, which is located near the top left portion of the page. (The URL is https://www-r.llnl.gov/servlet/page?_pageid=54,295,508&_dad=portal&_schema=PORTAL).

The second method of access is the AIS Enterprise Data Depot (EDD) Data Retrieval Facility, which provides system-level direct-access to ledger account detail data. This method requires users to establish a database connection by installing Oracle9i Database

Release2 Client for Win98/2000/XP/NT onto their computers.

Detailed instructions for both methods of access, with step-by-step screenshots, can be found at https://www-ais.llnl.gov/llnl_only/docs/dw/PH_Account_Database.html.

For more information on how users can access ledger account detail information via the MyLLNL Portal or via the Enterprise Data Depot (EDD), send an email to "EDD Support" at eddsupport@llnl.gov or contact Ray Lutton at lutton2@llnl.gov.

SATURN

Continued from page 1

and/or rocks that compose the rings and the moon Phoebe.

"Though we've known for years that the atmospheres of the giant planets are mainly made up of hydrogen and helium, using these instruments, we were able to measure the methane content with much greater precision than previous space missions," said Wishnow, who works in the Physics and Advanced

Technologies Directorate.

The methane measurement shows that carbon is enriched on Saturn by seven times the amount found in the sun and two times the amount found on Jupiter, which is consistent with the rocky core hypothesis of giant planet formation. In this model, Jupiter and Saturn began formation by accreting cores of about 10-12 times the size of Earth's mass of heavy elements, which in turn, attracts the surrounding nebular gas in solar proportions.

Wishnow's laboratory work was conducted with collaborators at the University of British Columbia and was supported by a NASA planetary atmospheres

grant.

Other collaborators on the CIRS project include scientists from NASA/Goddard Space Flight Center, the Jet Propulsion Laboratory and French and British institutions.

Cassini was launched in July 2004 with a mission to orbit around Saturn and its moons for the next four years. The Huygens probe is scheduled to enter the atmosphere of Titan, Saturn's biggest moon, today, and eventually descend on a parachute onto its surface about 2 hours later. Huygens will send its measurements and images to Cassini, which will then send them back to Earth.

TELESCOPE

Continued from page 1

on the universe. LSST will take exposures every 10 seconds, opening a movie-like window on objects that change or move on rapid timescales — exploding supernovae, Earth-approaching asteroids and distant Kuiper belt objects. Via the light-bending gravity of dark matter, LSST will chart the history of the expansion of the universe.

Steward Observatory's Mirror Lab team will create the mirror by melting borosilicate glass in a mold of hollow, hexagonal core boxes that give the mirror its strong, lightweight "honeycomb" structure. The Mirror Lab has produced four 6.5-meter mirrors and two 8.4-meter mirrors by this

technique in the last decade.

The prime engineering challenge of the LSST mirror will be to leave a large hole in the middle of the mirror, according to LSST Project Manager and Lab physicist Donald W. Sweeney. The hole will accommodate the telescope's 5-meter tertiary (third) mirror. The total LSST optical system will be "the fastest, most compact system of this scale ever built for an advanced research telescope," Sweeney said.

The LSST was one of the two highest priorities for future ground-based telescope facilities in the most recent Decadal Survey of Astronomy conducted by the National Academy of Sciences.

The immediate goal of the LSST Corporation is to prepare a detailed design for consideration by funding organizations and foundations, toward telescope first light as early as 2012. Four sites in Chile, Mexico, and the Canary Islands are cur-

rently being

evaluated to host the telescope, to be reduced to two finalists for the site in 2005.

More information and recent LSST graphics are online at <http://www.lsst.org>.

In 2003, the University of Washington, the University of Arizona, Research Corporation, and the National Optical Astronomy Observatory formed the LSST Corporation (LSSTC), a non-profit 501(c)3 Arizona corporation. Membership has now expanded to include the Laboratory, Brookhaven National Laboratory, Stanford Linear Accelerator Center, the Harvard-Smithsonian Center for Astrophysics, the Kavli Institute for Particle Astrophysics and Cosmology, Stanford University, the University of California at Davis, the University of Illinois at Urbana-Champaign and Johns Hopkins University.

Modesto - Vanpool has room for rider. Meets at Home Depot and leaves 6:35 am. Leaves Lab at 4:45 pm. Vanpool credit to cut costs. 209-576-0217, ext. 2-7459

Lafayette - LaMorinda Vanpool (also WALNUT CREEK stop at Rudgear Rd): reclining seats, reading lights, 7:45-4:45, \$105/mo (pretax reduction available) 925-943-6071, ext. 2-3005

SERVICES

Housecleaning Services. Good References, Good Experience. Free Estimates, Reasonable, Call Now!!!! 209-612-3185

Experienced, Very Reliable House/Pet sitter. Available in the Tri-valley area. Call for information and for me to house sit/care for your pets. 925-400-5106

Need Tutor? UCD grad teaches highschool and college Math, Physics and Astronomy, \$20/hr 925-354-3410

General Contractor services available for the mother lode area only. West Point, Moke Hill, Valley Springs areas. Please leave message. 209-293-4505

SHARED HOUSING

Livermore - Spacious room and bath in quiet new townhome. Full kitchen/laundry priviledges. No smoking/pets \$650 includes utilities 925-784-0011

Tracy - 4 bedroom 2.5 bath house close to freeways, schools, and shopping \$1,600 per month, will rent individual rooms 209-834-2972

TRUCKS & TRAILERS

2003 - 2003 Tahoe 30MS. NADA book value \$18500. Slide out, queen and bunk beds, tv center. \$16000.00 obo. will consider trade for motorhome or toy hauler. 209-825-7702

John Deere 850 24 HP 8 spd ag tractor w/roll bar and new

61 inch bucket loader, rebuilt motor by JD dealer. Excellent condition \$5,500 OBO 925-449-5481

1998 - Lincoln Navigator, purchased 8/97, 57,000 miles, original owner, loaded with options, excellent condition. \$15,000.00 209-823-0927

2004 - FORD F450 Supercab Superduty Dually 6.0L Powerstroke Diesel Automatic Custom, 40k. \$43,000 OBO 925-625-3191

VACATION RENTALS

Maui, HI - Kahana Reef oceanfront 1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. LLNL rates for year-round reservations. 925-449-0761

Sooo cute beach cottage in Santa Cruz. 2 bedr, 2 bath near boat harbor. Sunday-Thursday specials through March. \$ 75.00/night. 925-245-1114

SOUTH LAKE TAHOE - 3 Bedroom 2 Bath Chalet, comfortably furnished, all amenities, close to all skiing, RESERVE NOW FOR SKIING/WINTER FUN!! 209-599-4644

Kona Hawaii - Condo avail, 4/15/05 thru 5/13/05, Sleeps 2-4, fully equipped kitchen, downtown 5 min. walk, pool, snorkeling, ocean view \$500/wk 925-634-4831

South Lake Tahoe - Large comfortable home just minutes from skiing and casinos, game room and spa. 925-484-3162

Perfect location for skiers! Tahoe cabin for rent 2 blocks from Heavenly. Sleeps approx 8 adults. \$400/wk, \$200/wknd. 925-240-1615

WANTED

Wanted: Stihl or Husqvarna chain saw in good working condition. 4-6261 925-513-4767

Recent version of Suse Linux

Professional, hopefully with manual. Will buy or trade for PC hardware (cpus, sound cards, old laptop etc). 209-327-0012

Got a dusty, old Herp Habitat lying around? Will take it for the kids at home and school. Give it away or name me a good price. 925-202-3512

Flower girl dress, size 5. White, peach or cream color. 925-249-9186

Looking for a Moped, any condition. Please call. 209-836-2612

I am looking for a working PC Pentium 2 or 3 with monitor for my 8yr. old son. Low cost. 925-606-0755

Electrician wanted to install 3 new light fixtures (replacing old fixtures), 1 foyer and 2 outside. Tracy area. 209-834-1835

Looking for moving boxes, either to borrow until late February or for free if you would like to get rid of them. 596-0311



THE BACK PAGE

APS FELLOWS

Continued from page 1

tors here and internationally. This recognition is especially meaningful because it represents acknowledgment from one's peers."

For Tom Rognlien of the Physics and Advanced Technologies fusion energy program, the election to APS fellow was a long road. He said he had been nominated before but this was his "lucky" year.

"It's certainly gratifying," said Rognlien, who has worked in the Lab's fusion energy program for 30 years, specializing in computational models for magnetic fusion devices such as tokamaks. "I have had the opportunity to work with a lot of very talented people, which has made such recognition possible."

Rognlien was elected for "seminal contributions to the modeling of tokamak edge plasmas and their interaction with bounding surfaces and to the understanding of heating and transport in collisional and RF-excited plasmas."

Louis Terminello, materials program leader for the Defense and Nuclear Technologies Directorate and Chemistry and Materials Sci-



Tina Back



David J. Eaglesham



Tom Rognlien



Craig M. Tarver



Lou Terminello

ence Directorate, said he was pleased to be elected as a fellow for his synchrotron radiation experiments of novel materials such as nanoclusters, buckyballs and thin films.

"I feel very honored to first have been nominated and second, to be selected," said Terminello, who has worked at the Lab since 1991 and specializes in synchrotron radiation experiments. "I am very proud of the fact that I was able to do this work while at the Laboratory. I'm especially grateful to my many collaborators both here at the Lab and at other institutions."

Terminello's citation is for "his innovative use of synchrotron radiation spectroscopies in revealing the electronic and atomic structure of new materials."

Craig Tarver of CMS, who has worked at the Laboratory for 28 years, was elected "in

recognition of his contributions to shockwave physics and in particular his development and implementation of the ignition and growth model for reactions in energetic materials and the non-equilibrium ZND theory for detonating energetic materials."

"It's a great honor because I'm a chemist rather a physicist but my field of expertise, explosives, falls into both areas," said Tarver, who specializes in the theoretical and computational study of detonation waves. "I wasn't expecting this award."

David Eaglesham of CMS, who recently left the Laboratory, was also elected a 2005 fellow.

He was cited for "his seminal discoveries and technical leadership in semiconductor crystal growth and structural defects in epitaxial materials."

Congressional staff visit



JACQUELINE MCBRIDE/NEWSLINE

Touring the National Ignition Facility Tuesday were Scott O'Malia, second from left, and Tammy Cameron, second from right, from the Senate Committee on Appropriation/Subcommittee on Energy and Water Development. Joining them were Ron Cochran, Ed Moses and Bruce Warner.



Newsline
UC-LLNL
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